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2017 Undergraduate Research Symposium

Feb 18th, 9:00 AM - 10:00 AM

Oral Concurrent Session I: Biological Sciences

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9:00-10:00 AM (ROOM 1310)

Biological Sciences

Chair: Dr. Holly Gaff, Biological Sciences

Determining the Existence of a Short-term Link between Phenology and Climate Change

Blake Steiner (Mentor: Dr. Tatyana Lobova)

The Southeastern Virginia Phenology Project (SVPP), located in Norfolk, Virginia. This project is a branch of the National Phenology Network, and its data will be combined with other projects across the United States to ascertain the connections between plant phenophases and climate change through the power of citizen science. The importance of this data is related to many environmental and ecological issues, such as the effects on pollinators and seed dispersers. Furthermore, it is potentially related to health and food concerns, such as allergies. With this data, researchers can better address ecological, environmental, and health related inquiries.

Algal Endosymbiont Diversity in the Common Reef-Building Coral *Goniastrea* Ten Years after Experimental Bleaching

Caroline Haymaker (Mentors: Dr. Dan Barshis, Courtney Klepac)

Symbiotic dinoflagellates (*Symbiodinium*) have a mutualistic symbiosis with many coral species because both partners receive benefit via the exchange of nutrients. The successful interaction of these partners determines the success of coral reefs. Ten colonies of *Goniastrea* spp. were collected from inshore and offshore reefs surrounding Ofu Island, American Samoa in 2006 (n=20 total). The corals were experimentally bleached and, then reciprocally transplanted to each environment, to determine how *Symbiodinium* community structure and diversity recovers and changes with time. In 2016, DNA was extracted and three diagnostic molecular markers were amplified using PCR to investigate the diversity of *Symbiodinium* within each coral sample.

Too much sun? Growth rates of the Northern Star Coral, *Astrangia poculata*, in various light levels

Tyler Harman (Mentors: Dr. Dan Barshis, Hannah Aichelman)

This project focuses on the growth rates of *Astrangia poculata* over time in different stressful situations based on light. The *Astrangia* colonies were collected from the JB Eskridge wreck at the Chesapeake Light Tower reef. A total of 20 nubbins, 10 symbiotic and 10 aposymbiotic, will be separated evenly under two different scenarios, an area of light that measures $400\mu\text{mol}/\text{m}^2\text{s}$ and one that measures $80\mu\text{mol}/\text{m}^2\text{s}$. The methods that will be used to measure growth rates are photo *Symbiodinium* quantification from Winters et al. 2009, as well as the buoyant weight technique.

Use of Unionized Ammonia to Control Zooplankton Grazers in Cultures of *Scenedesmus* sp.

Blake Steiner and BRL Team (Mentor: Dr. Sandeep Kumar)

An experiment was conducted to limit *Scenedesmus* sp. grazers, as they continue to reduce biofuel yields. 2.5 L cultures of *Scenedesmus* sp. with zooplankton were inoculated in photobioreactors with 640 mg/L urea. 500 mg/L spike of NH_4Cl was used on day zero to test use of free ammonia to control grazers. Cell counts performed with hemocytometer and Gridded Sedgewick Rafter 1 mm^2 . Ammonia was measured using ion chromatography. Urea may impact zooplankton by day 8 out of 14, with 24-48 hour lag time after accumulating free ammonia. This was confirmed by NH_4Cl spike.